SUPPORT FOR THE AMENDMENTS

Claims 1, 4, 6, and 11 have been amended.

The amendment of Claim 4 is provided by original Claims 1 and 4, as well as the specification at pages 3-9, and the Examples. The amendment of Claims 1, 6, and 11 is supported by the specification at, for example, page 8, line 26 to page 9, line 13.

No new matter has been added by the present amendment.

REMARKS

Claims 1-15 are pending in the present application.

The rejection of Claims 1-15 under 35 U.S.C. §103(a) over Hwang et al in view of Abe et al, Ishii et al, and Murao et al is respectfully traversed.

Hwang et al disclose a method for producing an acrylamide polymer using a nitrile hydratase. However, Hwang et al do not disclose or suggest the content of oxazole and hydrogen cyanide in the acrylonitrile starting material. At page 3, lines 3-4 of the Office Action mailed July 18, 2007, the Examiner acknowledges this deficiency in the disclosure of Hwang et al.

With respect to Murao et al, although this reference discloses an enzymatic process of acrylonitile conversion to acrylamide in the presence of microbial cells containing a nitrile hydratase, at no point does this reference disclose the polymerization of acrylamide monomers prepared by hydrating acrylonitrile by using a nitrile hydratase. Further, as with Hwang et al, Murao et al do not disclose or suggest the content of oxazole and hydrogen cyanide in the acrylonitrile starting material.

To compensate for the foregoing deficiency in Hwang et al and Murao et al with respect to the content of oxazole and hydrogen cyanide, the Examiner cites two references: Ishii et al and Abe et al.

Ishii et al is cited as disclosing the desirability to reduce the concentration of hydrogen cyanide to a concentration of less than or equal to 1.0 mg/kg (i.e., 1 ppm) when using an enzymatic catalyst for the conversion of acrylonitrile to acrylamide.

Abe et al is cited as allegedly disclosing the reduction of oxazole concentration in a method of preparing acrylamide from acrylonitrile. However, notably the method disclosed

by Abe et al is not an enzymatic process but rather catalytic hydration with water in the presence of a copper-based catalyst (see document throughout, for example, at column 1, lines 6-8 and the Examples). Accordingly, Applicants submit that the method disclosed by Abe et al is substantially distinct from that disclosed by Hwang et al, Ishii et al, and Murao et al, as well as the present invention. As such, there would be no reason to combine the disclosure of Abe et al with any of Hwang et al, Ishii et al, and Murao et al much less infer similar results.

Indeed, the Examiner cites column 2, line 20 and alleges that Abe et al disclose that "acrylamide, which has been synthesized by subjecting the acrylonitrile to hydration has higher stability and when polymerized, provides an aqueous solution of higher viscosity compared with acrylamide synthesized likewise from oxazole-containing acrylonitrile". However, this allegation does not accurately reflect the disclosure of Abe et al at column 2, lines 17-33, which states:

> According to Japanese Patent Laid-Open No. 118305/1988 (corresponding to U.S. Pat. No. 4,177,210), for example, acrylonitrile as a raw material is brought into contact with an H-type cation exchange resin to lower the content of oxazole to 200 ppm or less, more preferably to 25 ppm or less in the acrylonitrile. This publication also discloses that acrylamide, which has been synthesized by subjecting the acrylonitrile to hydration ***in the presence of a copper-base catalyst***, has higher stability and when polymerized, provides an aqueous solution of higher viscosity compared with acrylamide synthesized likewise from oxazole-containing acrylonitrile. It is also disclosed that as a method for the regeneration of the cation exchange resin, the cation exchange resin is brought into contact with hot water, water vapor, methanol, a slightly-acidic aqueous solution or a mixture thereof. (*emphasis added*)

From the foregoing, it is clear that the disclosure by Abe et al is specific to hydration in the presence of a copper-based catalyst. As such, there is no reasonable basis to extend this statement to enzymatic catalyzed hydration.

Moreover, Applicants submit that the claimed method produce a resulting acrylamide polymer that is white when in the form of a powder and is colorless when in the form of an aqueous solution. None of Hwang et al, Abe et al, Ishii et al, and Murao et al disclose or suggest the improvement of quality of an acrylamide polymer as provided by the presently claimed invention (see page 8, line 26 to page 9, line 13 of the present specification). Indeed, the color improvement of the acrylamide polymer represents an unexpected result flowing from the claimed method and clearly represents a distinct acrylamide polymer product.

Despite Examiner's arguments to the contrary, Applicants again submit that the results demonstrated in the Example of the present specification clearly underscore the criticality of the claimed oxazole and hydrogen cyanide content in the acrylonitrile starting material vis-à-vis the color of the polymer powder. Applicants again direct the Examiner's attention to the results set forth in Table 1 on page 13, which is reproduced below:

	Acrylonitrile Used		Polymer Aqueous Solution		Color of Polymer Powder
	Oxazole Concentration [mg/kg]	Hydrogen Cyanide Concentration [mg/kg]	1% Salt Viscosity [mPa·s]	Solubility	
Example 1	≤5	0.7	3600	+	+
Comparative Example 1	10	0.7	3620	–	±
Comparative Example 2	10	5	3550	–	–
Comparative Example 3	≤5	5	3580	–	±

Solubility: +: Almost no gelatinous substance; –: Gelatinous substance observed
Color: +: White; ±: Slightly yellow; –: Yellow

Clearly these data show the criticality of the claimed oxazole and hydrogen cyanide content in the acrylonitrile starting material. In particular, Applicants direct the Examiner's attention to Example 1 and Comparative Example 3, which supports a conclusion of unexpectedness. Specifically, although the only difference between Example 1 and Comparative Example 3 is the concentration of hydrogen cyanide, Example 1 shows improvement in the solubility of polymer aqueous solution and the color of the polymer powder. Heretofore, it was known that hydrogen cyanide contained in acrylonitrile is a catalytic poison. However, the skilled artisan would not know that the concentration of hydrogen cyanide in acrylonitrile affects the quality of acrylamide polymers. Therefore, the results set forth in Table 1 on page 13 of the specification are unexpected. And, as such, the combination of Hwang et al, Abe et al, Ishii et al, and Murao et al do not support an obviousness rejection.

In view of the foregoing, withdrawal of this ground of rejection is requested.

Applicants submit that the present application is now in condition for allowance. Early notification of such action is earnestly solicited.

Respectfully submitted,

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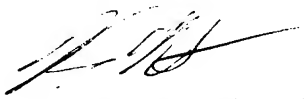
Norman F. Oblon



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